MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

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# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**T2, 2019/ 2020**

20th JAN 2020
9.00 a.m – 12.00 p.m
(3 Hours)

## BDM7124 – DATABASE MANGEMENT

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**INSTRUCTIONS TO STUDENTS**

1. This question paper consists of 5 pages (including this cover page) with **FOUR** questions.

2. Answer **ALL** questions. Distribution of the marks for each question has been provided.

3. Answers should be written in the **Answer Booklet** provided.

## Question 1

Micro loans are small loans, which is beginning to gain popularity especially among borrowers in developing countries. The idea is to bring venture lenders together using information technology. Typically, the loans will be used to finance start-up or development of the borrower's company, so that there is a realistic chance for repayment. The money in a loan can, unlike traditional loans, come from many lenders. In this problem, you must create an E-R model that describes the information necessary to manage micro loans. The following information form the basis for creating the model:

a) Each borrower and lender must be registered with information about name and address.
b) A loan starts with a loan request, which contains information about when the loan should at latest be granted, the total amount being discussed (US-dollars), and how long the payback period is. Also, a description is included of how the money will be used. The rent on the payment is calculated in the loan amount, which is to say, the full amount is not paid.
c) Lenders can commit to an optional portion of the total amount of a loan request.
d) When the commitments for the loan request covers the requested amount, the request is converted to a loan. If not enough commitments can be reached, the loan request is cancelled. A borrower can have more than one request, and more than one loan at a time, but can at most make one request per day.
e) The loan is paid through an "intermediary", typically a local department of a charity, who has a name and an address.
f) The borrower chooses when he or she will make a payment. Every payment must be registered in the database with an amount and a date (at most one payment per loan per day). The lenders share the repayment based on how large a part of the loan they are responsible for.
g) If the loan is not repaid before the agreed upon deadline, a new date is agreed. The database must not delete the old deadline, but save the history (the deadline can be overridden multiple times).
h) Each lender can for each burrower save a "trust", which is a number between 0 and 100 that determines the lender's evaluation of the risk of lending money to that person. The number must only be saved for the borrowers, for whom there has been made such an evaluation.

**Required:**

Draw an E-R model for the data described above. If you make any assumptions about data that doesn't show from the problem, they must be described. Emphasize on having the model express as many properties about the data as possible, for instance participation constraints. **(Total: 25 marks)**

**Continued .....**

**Question 2:**

The following questions are based on the relational schema below:
**Flights:**
flno:integer,from:string,to:integer,distance:integer,departs:time,arrives:time,price:integer
**Aircraft:** aid:integer,aname:string,cruisingrange:integer
**Certified:** eid: integer, aid:integer
**Employees:** eid: integer,ename:string,salary:integer

Note that the Employee relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL:

a) Find the names of aircraft such that all pilots certified to operate them earn more than RM500,000. (5 marks)

b) For each pilot who is certified for more than 8 aircrafts, find the *eid* and the maximum *cruisingrange* of the aircraft that he (or she) is certified for. (5 marks)

c) Find the names of pilots who earn a salary less than the price of the cheapest route from New Mexico to New Jersey. (5 marks)

d) Find all the aircraft with a *cruisingrange* over 25,000 miles, find the name of the aircraft, maximum salary of all pilots certified for this aircraft. (5 marks)

e) Find the names of pilots certified for some Airbus aircraft. (5 marks)

**(Total: 25 marks)**

**Question 3:**

Sony Music Company has decided to store information about musicians who perform on it's albums (as well as other recording company data) in a database. Sony has selected you to design it's database and the following data has been furnished to you:

- A musician has a SSN, name, addresses and a phone number.
- Musicians that don't earn well share the same address and two addresses cannot have more than one phone number.
- Each musical instrument used in recordings has a unique identification number, a name, (e.g. guitar, synthesizer, flute) and a musical key (e.g. C, B-flat and E-flat).
- Each album recorded has a unique identification number, a title, copyright date, format (i.e. CD or MC) and an album identifier.

**Continued .....**

- Each album has several songs on it, but a song cannot appear on more than one album.
- Each song has a title and author.
- A musician may play several instruments and a given instrument may be played by several musicians.
- Each song is performed by one or more musicians and a musician may perform several songs.
- Each album has a musician who acts as a producer. A musician can produce several albums.

**Required:**

a) Draw an Entity-Relationship Diagram (note: create the structure, entity, attributes, relationships, weak entity sets (if any) and cardinality constraints) (15 marks)

b) How would you change your design if each album has a musician who has an option not to be a producer? (5 marks)

c) How would your design change if design requirements change as follows: Songs are performed by musicians more than once and several such performances must be stored? (5 marks)

**(Total: 25 marks)**

**Question 4:**

The following PRODUCT table has been extracted for you.

| PCODE | PNAME | PDESC | PPRICE |
|---|---|---|---|
| P001 | MONITOR | LG 15" | 400 |
| P002 | MONITOR | LG 17" | 450 |
| P003 | RAM | 128MB SDRAM | 80 |
| P004 | RAM | 128MB DDRAM | 100 |
| P005 | HARD DISK | 20GB | 120 |
| P006 | HARD DISK | 40GB | 200 |
| P007 | NETWORK CARD | 10/100 LAN | 90 |

Based on the table below you are to write SQL statements for the following queries and also provide the correct output result that should appear in a table form:

a) Update the records price of product P007 from $90 to $150. (5 marks)
b) Remove product P006 permanently from table. (5 marks)

**Continued .....**

c) List out the product code, name and price for product called MONITOR. (5 marks)

d) List out the product code, name and price for products where the price is greater than $100 or less than $100. (5 marks)

e) Select products where prices range from $150 to $450. (5 marks)

**(Total: 25 marks)**

**END OF EXAM QUESTIONS**